AD-830

Electrical Troubleshooting Manual 1995 / 1996

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082396WS

ADC Part No. 182713

Retain This Manual In A Safe Place For Future Reference

American Dispensing Company products embody advanced concepts in engineering, design, and safety. If this product is properly maintained, it will provide many years of safe, efficient, and trouble-free operation.

ONLY properly licensed technicians should service this equipment.

Observe all safety precautions displayed on the equipment or specified in the installation/operator's manual included with the water vending machine.

UNDER NO CIRCUMSTANCES should the pressure switch(s) or other safety devices ever be disabled.

We have tried to make this manual as complete as possible and hope you will find it useful. ADC reserves the right to make changes from time to time, without notice or obligation, in prices, specifications, colors, and material, and to change or discontinue models.

Important

For your convenience, log the following information:

Date of Purchase _____ Model No. **AD-830**

_____

Serial Number(s) _____

Door Key Number(s) _____

Coin Vault Number(s) _____

Replacement parts can be obtained from your distributor or the ADC factory. When ordering replacement parts from the factory, you can FAX your order to ADC at (508) 678-9447 or telephone your orders directly to the ADC Parts Department at (508) 678-9010. Please specify the water vending machine **model number** and **serial number** in addition to the **description** and **part number**, so that your order is processed accurately and promptly.

IMPORTANT

YOU MUST DISCONNECT and LOCKOUT THE ELECTRIC SUPPLY BEFORE ANY COVERS or GUARDS ARE REMOVED FROM THE MACHINE TO ALLOW ACCESS FOR CLEANING, ADJUSTING, INSTALLATION, or TESTING OF ANY EQUIPMENT per OSHA (Occupational Safety and Health Administration) **STANDARDS.**

CAUTION

LABEL **ALL** WIRES PRIOR TO DISCONNECTION WHEN SERVICING AD-830. WIRING ERRORS CAN CAUSE IMPROPER AND DANGEROUS OPERATION.

FOR YOUR SAFETY

THE SYSTEM IS SHIPPED WITH A PRESERVATIVE SOLUTION MADE OF SODIUM BISULFITE AND (IN THE WINTER MONTHS) GLYCERINE. MAKE SURE THE SYSTEM IS THOROUGHLY PURGED BEFORE LETTING ANYONE DRINK THE DISPENSED WATER.

REFER TO THE INSTALLATION SECTION ON PURGING PROCEDURE.

CAUTION

Never look directly into the unprotected parts of the U.V. chamber when there is power to the sterilizer. **Serious burns to the eyes and the skin may result.** Always unplug power to the sterilizer before working on it.

IMPORTANT

Please observe all safety precautions displayed on the equipment and/or specified in the installation / operators manual included with the AD-830.

IMPORTANT

The wiring diagram for the water vending machine is located behind the coin control door.

Water vending machine(s) **must not** be installed or stored in an area where it will be exposed to water and/or weather.

Table of Contents

MICROPROCESSOR FAILURE CODES

The microprocessor continually monitors the machine operation. When an error occurs the machine will display a variety of failure codes, which will lead the service technician to the potential problem. The messages displayed do not pinpoint the problem within the wiring of the machine. However, they will indicate one or more possible failures. Reference to the wiring diagram is necessary.

The possible "OUT OF ORDER" failure codes will consist of the following:

1. **FLOW METER**... this failure indicates the machine has a dispensing problem. The microprocessor did not detect a flow of water on either side (refer to Item #1 on page 4.)

2. **R.O. FILTER** ... this failure indicates the R.O. membrane filter is in need of service, or may signify a problem with the R.O. comparator. (refer to Item #2 on page 6)

3. **FILTER**...this failure can indicate a variety of problems: (refer to Item #3 on page 7)

    a. Sediment and/or carbon filters are in need of replacement.

    b. High pressure switch has been triggered.

    c. Supply water is continuously less than recommended installation specifications.

4. **OVERFLOW** ...this failure can indicate a variety of problems (refer to item # 4 on pg. 8).

    a. U.V. light has failed and is in need of service.

    b. Base float switch has been triggered.

    c. Tank overflow float switch has been triggered

    d. Vending bay tank overflow switch has been triggered.

    e. Relay board failure.

5. **USE OTHER SIDE**...this failure indicates the microprocessor does not detect a flow of water on the side that is in use. The microprocessor will shut down this side and transfer the purchase to the other side (refer to Item #1 on page 4.)

6. **CHNGR UNPLUG**...this failure indicates there is a problem communicating with the coin changer. (refer to Item #5 on page 11)

7. **SYSTEM REFILL PLEASE WAIT**...this message indicates the water in the containment tank is low and is in the process of being refilled. The message will automatically be reset when the system has enough water to cover the maximum amount of water that can be dispensed in one purchase. (refer to Item #6 on page 12).

8. **SYSTEM PURGE DO NOT DRINK**...this message will appear upon turn on of the machine. It is not actually a failure but an installation safeguard. This routine will flush out the preservatives that keep the R.O. Membrane contaminant free during storage. The flushing will be accomplished by dispensing water for an extended period of time which will stop automatically.

NOTE: With the exception of #6, ALL failure codes can be reset by entering the following key combinations ([6 GAL.]) left, [6 GAL.] right, [5 GAL.] left, [5 GAL.] right, [1/2 GAL.] left). If the trigger failure is still present, the code will not reset.
DO NOT RESET THIS SAFETY ROUTINE FOR THE INSTALLATION.

ELECTRICAL PROBLEMS ASSOCIATED with MICROPROCESSOR FAILURE CODES

1. FLOW METER ERROR

The Flow Meter error message could be the result of the following:

a. Flow meter failure.

1) Flow meter sensor may need replacement.

2) Flow meter housing may need replacement.

b. A disconnected plug on the microprocessor panel.

c. Failures with the dispensing solenoid valves.

d. The trap door switch is defective or misadjusted.

e. Defective trap door solenoid.

f. Microprocessor output failure.

g. Faulty dispensing pump.

1) Unplugged dispensing pump.

2) Defective dispensing pump.

3) Defective relay board.

h. Polishing filter is in need of replacement.

Verify that the dispensing pump is plugged in. Confirm ALL connections to and from the relay board. Refer to wiring diagram Section (A-1 through B-3) for Flow meter Wiring, Section D-1 through E-4 for Dispensing Valve, trap door solenoid and switch, and Section C-6 through E-8 for Dispensing Motor wiring.

Flow Meters

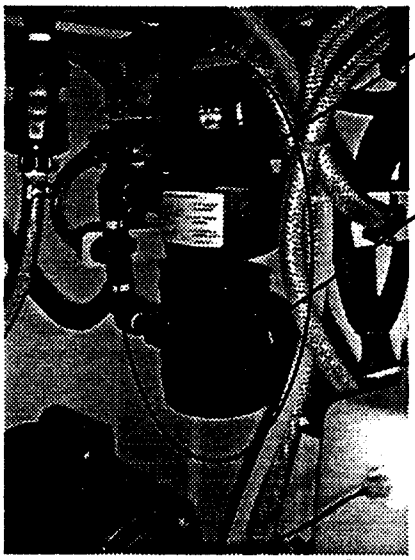
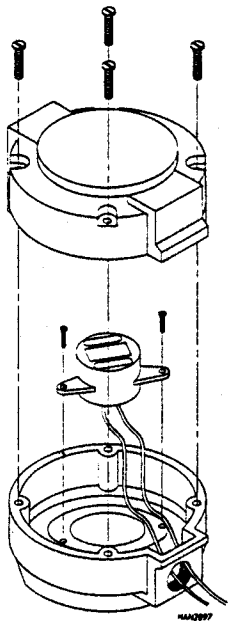
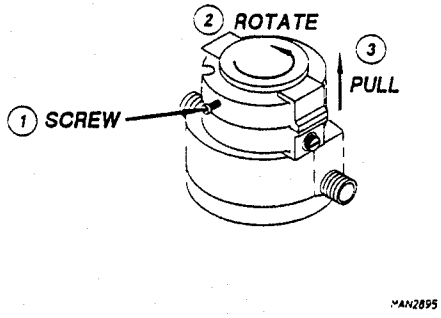


Fig. 1





Microprocessor Panel

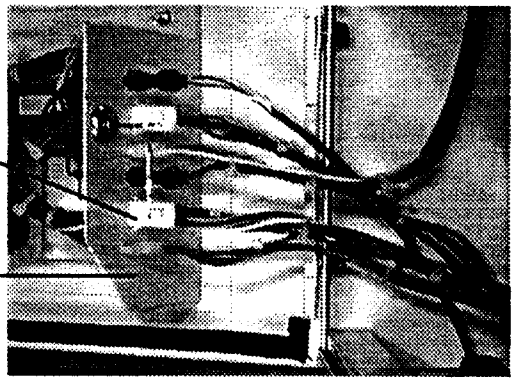


Fig. 2

Vending Assembly

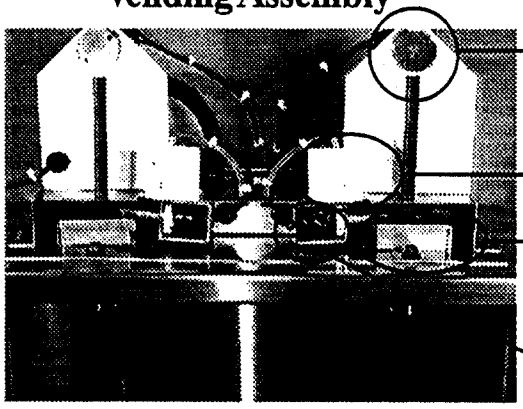


Fig. 3

NOTE: When a complete flow meter is changed some reprogramming is required. The machine is relying on the information provided by the flow meter for accurate vending. The counts per gallon in the program will have to be changed along with the flow meter. If just the sensor element is replaced, the recalibration may not be necessary.

To set just the calibration on both vending bays using teach mode proceed as follows.

Step #1

a. Vend at least 1 gallon in both bays to purge out air pockets in the lines prior to calibration.

b. Turn the keypad program switch to the program mode.

c. Press the [1/2 GAL.] selection key on the left, then press the [1/2 GAL.] selection key on the right. Both displays will flash "TEACH MODE".

d. Place two calibrated 1 gallon containers in the vending bay, one on each side.

e. Press and hold the [1 GAL.] selection key on right to activate the pulse count routine for both vending bays.

f. When the gallon has filled completely, release the key.

g. If the two 1 gallon containers are not filled evenly, you can vend small amount of water by pressing the [1/2 GAL.] selection key on the right for the left bay or the [2 GAL.] selection key on the right for the right bay.

h. Press the [1 GAL.] selection key on the left, then press the [1 GAL.] selection key on the right. This is necessary to retain the information in memory.

NOTE: After the counts have been derived the microprocessor will not override the previous values that are stored in memory. The microprocessor needs an enter confirmation. By pressing the [1 GAL.] selection key on the left, then the [1 GAL.] selection key on the right you will confirm the new entries.

i. The display will then show the new values.

j. Turn the keyed program switch back to the run position.

2. R.O. FILTER ERROR

The R.O. Filter error message could be the result of the following:

a. The R.O. Membrane is in need of replacement or cleaning;
Take a TDS measurement of the inlet and product side of the R.O. membrane. The product TDS measurement should be 25% or less of the input TDS measurement. The TDS measurement can only be taken after the 3/4 HP pump has run at least 1 minute.

b. The R.O. Comparator has failed;
Test the R.O. Comparator with an ADC comparator tester.

c. The test cell has failed;
Remove and inspect both test cells for broken leads and corrosion.

(Refer to wiring diagram Section A-1 through A-5 for electrical reference).

R.O. Comparator

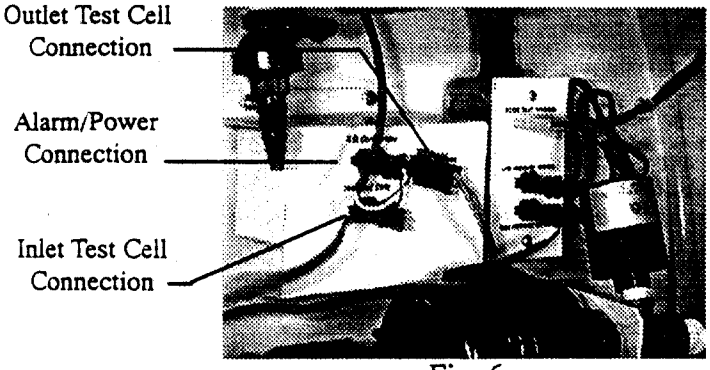


Fig. 6

Test Cells

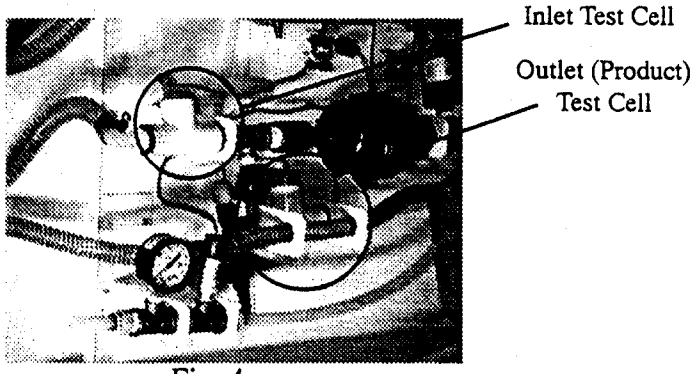


Fig. 4

3. FILTER ERROR

The filter error message could be a result of the following:

a. The sediment and/or carbon filters are in need of replacement.
Monitor the pressure gauges while the machine is in operation. Determine which filter has a 10 P.S.I. differential pressure while the R.O. pump is running.

b. The high pressure switch has been triggered
Verify the pressure in the system is set at 175 psi. If the pressure exceeds 175 psi, check drain is not restricted also determine if check valve is stuck closed.

c. The incoming water supply to the machine has decreased less than 35 psi
Verify the incoming pressure while running, never drops less than 35 psi.

(Refer to wiring diagram Section C-5 through D-5 for high & low pressure switch wiring).

Pressure Gage and High Pressure Switch

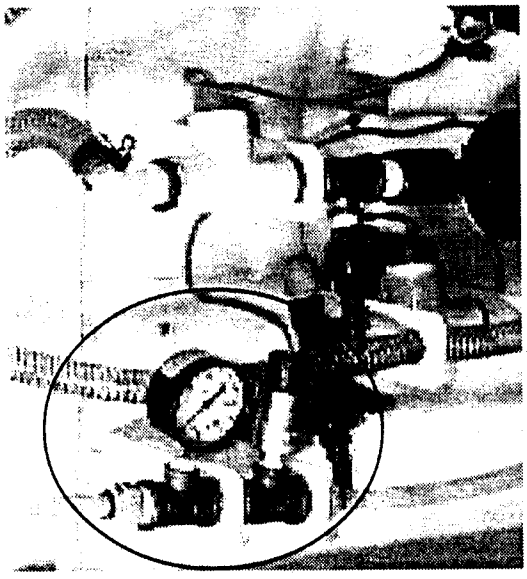


Fig. 7

Low Pressure Switch

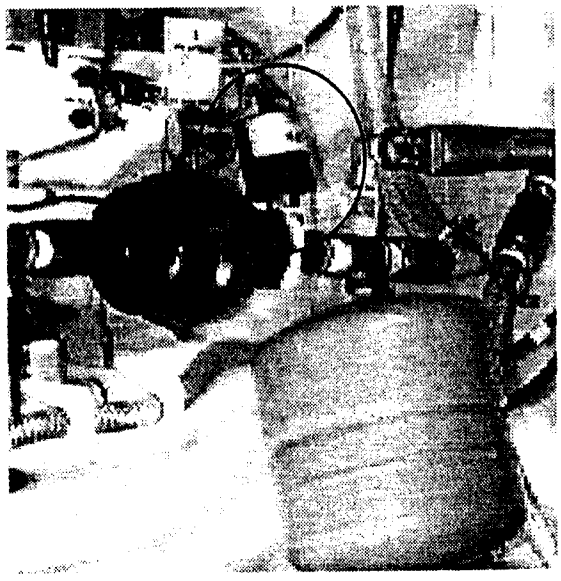


Fig. 8

Pressure Regulator

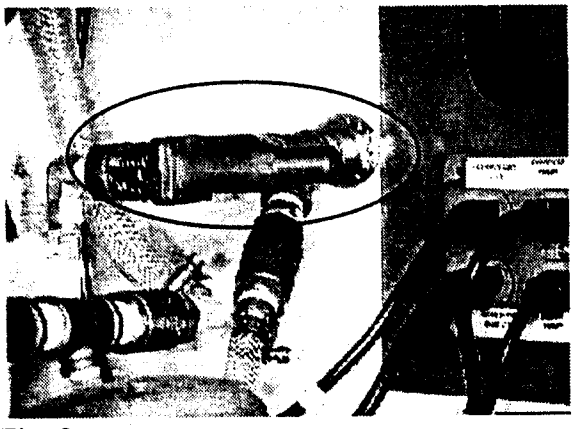


Fig. 9

High/Low Pressure Switch Connections

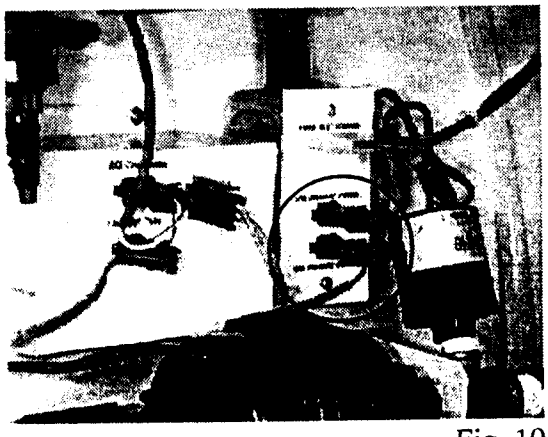


Fig. 10

4. OVERFLOW ERROR

A. U.V. Light

An overflow error triggered by the U.V. light could be a result of the following:

a. The U.V. light is not plugged in.

b. The U.V. light is defective.

c. The alarm connection to the relay board is not plugged in.

d. The alarm on the U.V. Light has been triggered.

The bulb is not at the correct intensity and is in need of replacement (refer to bulb replacement in the ADC Water Vending Machine Manual Part No. 182714).

e. Defective Relay Board

(Refer to wiring diagram Section C-5 through D-5 for electrical reference).

U.V. Intensity Indicator

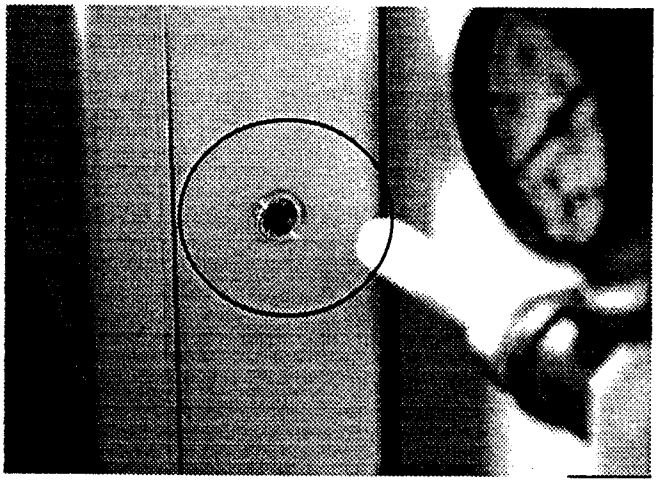


Fig. 11

U.V. Light Alarm Connection

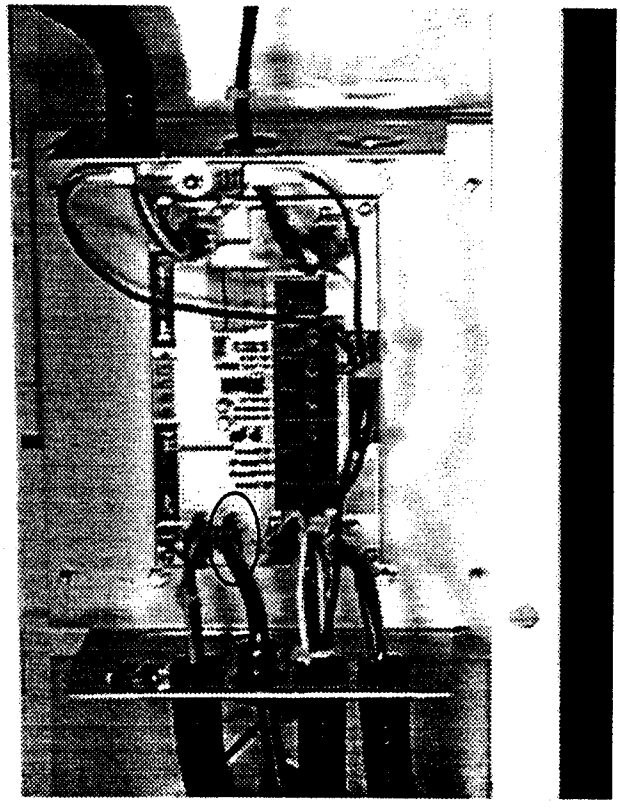


Fig. 12

B. Base Float Switch

An Overflow error triggered by the Base Float Switch could be a result of the following:

a. The Base Float Switch has been disconnected.

b. The Base Float Switch has been triggered due to water flood in cabinet.

c. The Base Float Switch has failed.

d. The relay board has failed.

(Refer to wiring diagram Section C-7 through C-8 for electrical reference).

Base Float Switch

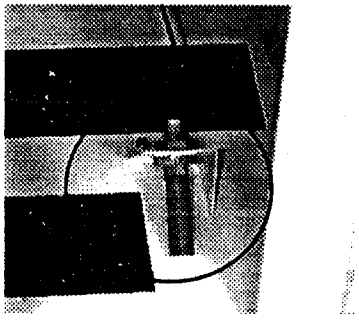


Fig. 13

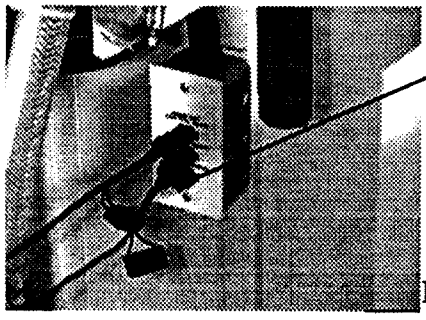


Fig. 14

C. Containment Tank Overflow Switch

An Overflow error triggered by the Tank Overflow switch could be a result of the following:

a. The Tank Overflow Float Switch has been disconnected

b. The Tank Overflow Switch has failed.

(Refer to wiring diagram Section B-7 for electrical reference).

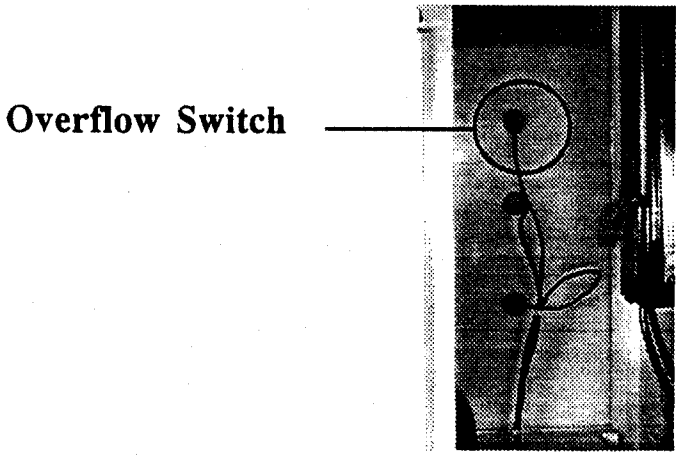


Fig. 15

D. Vending Bay Tank Overflow Switch

An Overflow error triggered by the vending bay Overflow Switch could be a result of the following:

a. The Vending Bay Tank Overflow Switch is disconnected.

b. The Vending Bay Tank Overflow Switch has triggered due to water not draining out of the tank.

c. The Vending Bay Tank Overflow Switch has failed.

d. Unplugged drain pump.

e. Defective drain pump.

f. Defective relay board.

Verify that the drain pump is plugged in. Confirm ALL connections to and from the relay board. Verify that the relay board is operational.

(Refer to wiring diagram Section B-3 for electrical reference).

Overflow Switch

Fig. 15

Switch Positioning

Overflow Switch

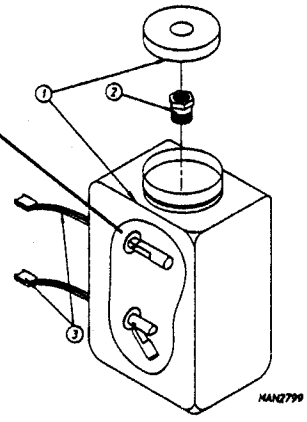


Fig. 16

Vending Bay Tank Overflow Float Switch Connection

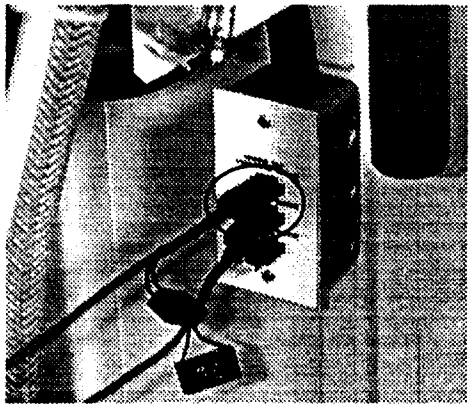


Fig. 17

5. CHNGER UNPLUG ERROR

The CHNGER UNPLUG error message could be a result of the following:

a. Coin changer is unplugged

b. Defective coin changer

c. Defective power supply

(Refer to wiring diagram Section B1 - C5 for coin changer wiring).

Coin Changer

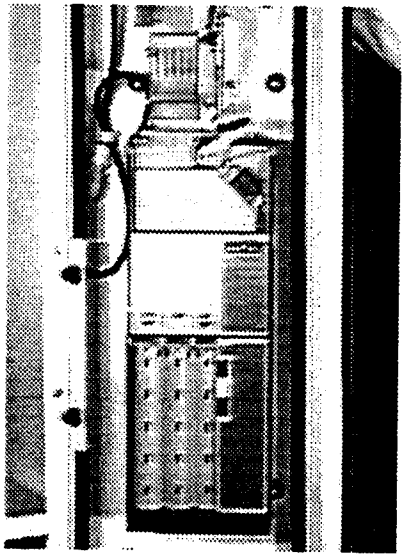


Fig. 18

Microprocessor Panel

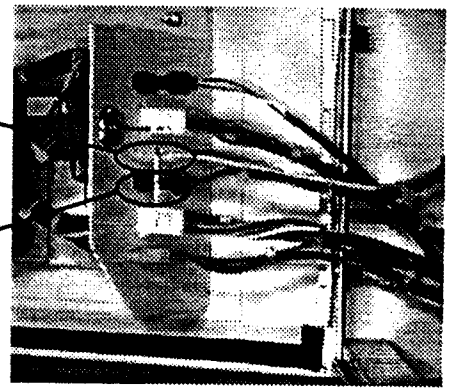


Fig. 19

Power Supply

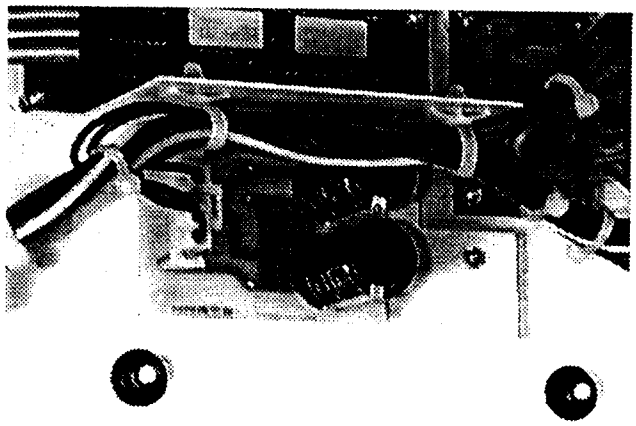


Fig. 20

6. SYSTEM REFILL PLEASE WAIT

The "System Refill Please Wait" message could be a result of the water level in the containment tank is below the low level switch. If the machine is functioning correctly it should be refilling. The message will automatically reset 1 minute after the water level has reached the low level switch. A "System Refill Please Wait," message that does not reset could be the result of the following:

a. Shorted Low level float switch

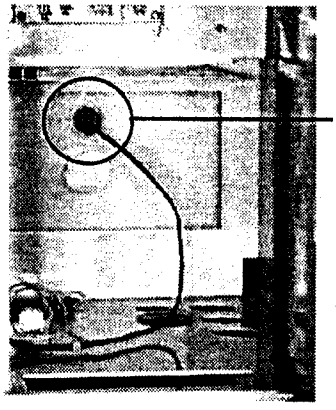
b. Inoperative 3/4 hp motor (refer to Item #3 on page 14)

c. Inadequate water supply to machine

d. Filters are in need of replacement

(Refer to wiring diagram Section A1-A3 for Tank Low Level Float Switch wiring).

Switch Location onTank



Low Level Switch

Low level and left/right flow meters input connection

Fig. 21

Microprocessor Panel

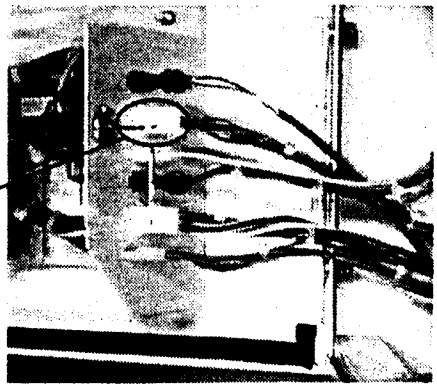


Fig. 22

Pump Motors

1. DISPENSING PUMP MOTOR

An Inoperable dispensing pump could be a result of the following

a. The polishing filter is in need of replacement.

b. Unplugged Pump Motor

c. Vending problem (refer to section 1 page 4)

d. Defective relay board

NOTE: You must verify the dispensing pump is plugged in. Verify both the trap door and vending solenoids are opening.

(Refer to wiring diagram Section C-5 through E-8 for Dispensing Pump Motor wiring).

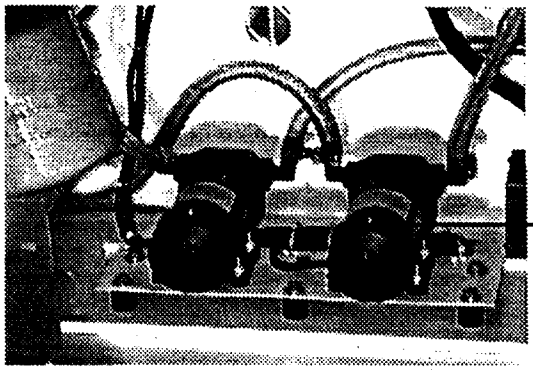


Fig. 23

2. DRAIN PUMP MOTOR

An inoperable drain pump could be a result of the following:

a. Clogged drain

b. Unplugged spill switch

c. Incorrect positioning of the spill switch.

d. Mechanical malfunction of the drain check valve.

When the spill switch is changed it is important that it is positioned correctly. Incorrect positioning will change the switch into a normally closed contact causing the drain motor to continuously run (refer to fig. 25).

(Refer to wiring diagram Section B-3 - B-4 for Spill Switch wiring).

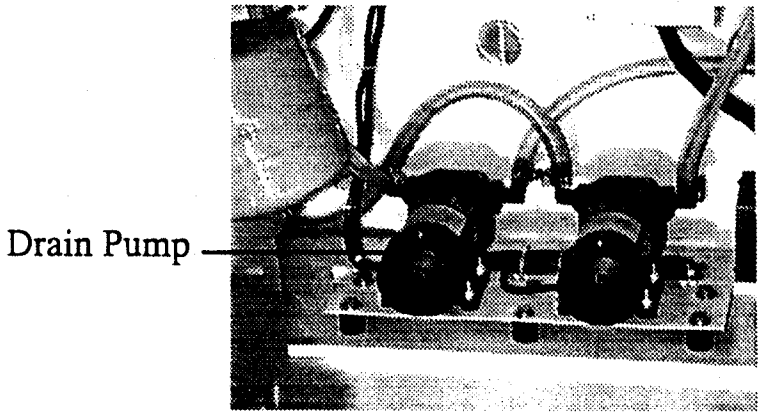


Fig. 24

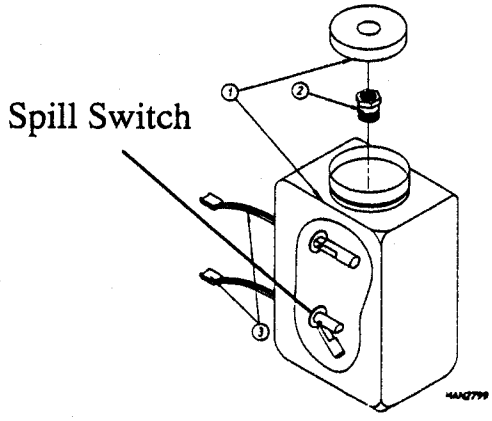


Fig. 25

3. 3/4 HP MOTOR

An operable 3/4 hp pump could be a result of the following:

A. No water supply to machine

B. Unplugged or defective low and or high pressure switches

C. Defective inlet solenoid

D. Defective relay board

E. Defective motor contactor

F. Defective 3/4 hp motor

G. Defective inlet water solenoid

(Refer to wiring diagram Section A-8 - A-9 for 3/4 HP motor wiring).

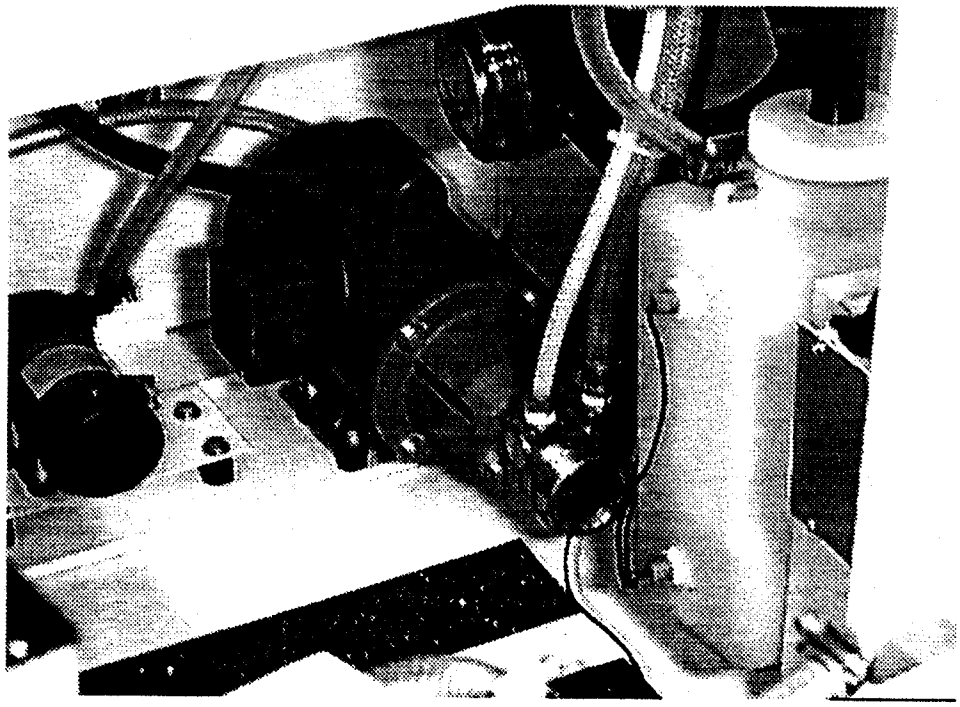


Fig. 26

Electrical Components List

ADC Part No. 123000	Indicator Light - 115 VAC
ADC Part No. 123001	Indicator Light - 220 VAC
ADC Part No. 123005	Indicator Light - 24 VAC
ADC Part No. 132077	240v 50Hz/24 Volt Transformer - 200VA
ADC Part No. 132451	Contactor - 24 VAC
ADC Part No. 133356	Power Cord - 120 VAC
ADC Part No. 137060	Arc Suppressor (A.S.) Board
ADC Part No. 182000	Keypad Label
ADC Part No. 182010	Display Board
ADC Part No. 182012	Ribbon Connector
ADC Part No. 182014	Microprocessor (Computer) Controller/Coin Changer Version
ADC Part No. 182016	Relay Board - 24 VAC
ADC Part No. 182020	Coin Changer Power Converter
ADC Part No. 182049	Dispensing/Circulation Solenoid - 24 VAC
ADC Part No. 182050	Main Water Solenoid - 24 VAC
ADC Part No. 182060	Trap Door Solenoid - 24 VAC
ADC Part No. 182080	Reverse Osmosis (R.O.) Comparator with leads
ADC Part No. 182081	Reverse Osmosis (R.O.) Comparator Test Cells
ADC Part No. 182100	3/4 HP Motor - 115/240 VAC 60Hz
ADC Part No. 182101	3/4 HP Motor - 115/240 VAC 50Hz
ADC Part No. 182128	3.5 GPM Pump - 115 VAC 60Hz
ADC Part No. 182129	3.5 GPM Pump - 240 VAC 50Hz
ADC Part No. 182200	Ultraviolet (U.V.) Light with Alarm
ADC Part No. 182298	High Pressure Switch
ADC Part No. 182299	Low Pressure Switch
ADC Part No. 182305	Float Switch - 24 VAC Internal Mount
ADC Part No. 182306	Float Switch - 24 VAC External Mount
ADC Part No. 182307	Normally Closed Door Switch - 24 VAC
ADC Part No. 182352	Flow Meter
ADC Part No. 182355	Flow Meter Sensor
ADC Part No. 182450	Ground Fault Interrupter
ADC Part No. 182451	Push Mount Wire Tie
ADC Part No. 182453	6-Amp (Fast Acting) Fuse
ADC Part No. 182455	120V 60Hz/24-Volt Transformer - 150VA
ADC Part No. 182468	Keyed Program Switch
ADC Part No. 182470	Flourescent Light
ADC Part No. 182471	8 Watt Flourescent Lamp Replacement
ADC Part No. 182804	Coin Changer
ADC Part No. 182812	Australian Coin Changer
ADC Part No. 182820	Bill Validator


ADC
American Dispensing Co.